

REMARKS

Favorable reconsideration is respectfully requested in view of the foregoing amendments and following remarks.

In the amended claims, (1) the scope of the dihydrotriazine compound in amended claim 18, the sterilizing/disinfecting method claim 34, the preparation method claim 35 of external bactericidal/disinfectant agent and the external bactericidal/disinfectant agent claim 36 has been limited to the dihydrotriazine compound of the formula (1a);

(2) the substituents of the recitation of “optionally substituted” have been specifically defined in amended claim 18, based on the disclosures of page 14, lines 8-29 and page 21, lines 14-15, and 20-22, as shown below.

Substituent(s)

“a halogen atom, a hydroxy group, a nitro group, a cyano group, a C₁₋₆ alkyl group, a C₁₋₆ haloalkyl group, a C₃₋₆ cycloalkyl group, a C₆₋₁₀ aryl group, a C₆₋₁₀ aryloxy group, a C₁₋₆ alkoxy group, a C₁₋₆ haloalkoxy group, a C₃₋₆ cycloalkyloxy group, a C₁₋₇ alkanoyl group, a carboxyl group, a carbamoyl group, a C₂₋₇ alkoxycarbonyl group, a C₂₋₇ haloalkoxycarbonyl group, a C₇₋₁₁ aryloxycarbonyl group, a C₄₋₇ cycloalkyloxycarbonyl group, an amino group, a C₁₋₆ alkylamino group, a C₁₋₆ haloalkylamino group, di-C₁₋₆ alkylamino group, a C₁₋₇ alkanoylamino group, a cyclic amino group, a C₂₋₇ alkylaminocarbonyl group, a mercapto group, a sulfonic acid group, a sulfonamido group, a C₁₋₆ alkylthio group, a C₁₋₆ haloalkylthio group, a C₁₋₆ alkylsulfonyl group, a C₁₋₆ haloalkylsulfonyl group, a C₁₋₆ alkylsulfonyloxy group, a C₁₋₆ haloalkylsulfonyloxy group, a C₁₋₆ alkylsulfonylamino group, or a C₁₋₆ haloalkylsulfonylamino group”;

- (3) “a hydrogen atom” has been deleted from the scope of R₁ in the formula (1a);
- (4) the scope of R₃ and R₄ has been limited to “a hydrogen atom or a methyl group”;
- (5) present claims 14-17, 19-20, 26, 29 and 31-33 have been cancelled; and
- (6) new claim 36 has been incorporated.

Turning to the Official Action, claim 29 is objected to on the basis of an informality.

Claim 29 has been cancelled without prejudice.

Accordingly, this ground of objection is deemed to be overcome.

Claims 14-35 are rejected under 35 USC 112, second paragraph, as being indefinite for the reasons set forth.

The claims have been amended to remove the term "general" in the term "general formula", as kindly suggested by the Examiner.

Accordingly, this ground of rejection is deemed to be overcome.

Claims 14-20, 26 and 30-35 are rejected under 35 USC 112, second paragraph, as being indefinite for the reasons set forth.

The claims have been amended to recite the optional substitutents according to the specification.

Accordingly, this ground of rejection is deemed to be overcome.

Claims 14-15 and 33 are rejected under 35 USC 102 as anticipated by U.S. Patent No. 3,287,365.

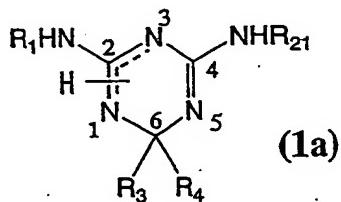
This ground of rejection is deemed to be overcome by the cancellation without prejudice of claims 14-15 and 33.

Furthermore, the features of the present invention are the following:

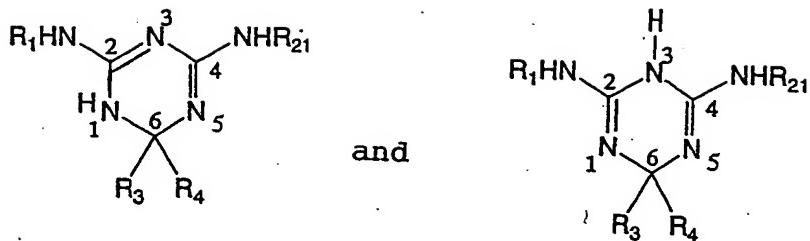
The dihydrotriazine compound of the present invention is structurally characterized by the combination of

(1) an amino group mono-substituted by a phenyl, phenylalkyl, naphthyl, naphthylalkyl, heterocyclic group, heterocyclic alkyl group, heterocyclic aminoalkyl group, C₁₋₁₆ alkyl group, cycloalkyl group or a cycloalkyl-alkyl group, which is unsubstituted or substituted by specific substituent(s) defined in amended claim 18, at the 2-position, and

(2) an amino group mono-substituted by a C₇₋₁₆ alkyl group, which is unsubstituted or substituted by specific substituent(s) defined in amended claim 18, at the 4-position of dihydrotriazine of the formula (1a). Please see the following formulas.



i.e.



Furthermore, the compounds of the present invention exert effects of sterilizing or disinfecting, and are useful as external bactericides and disinfectants. See for example page 32, lines 19-28 of the specification.

The present inventors evaluated firstly the bactericidal property of 2,4-di(mono-substituted amino)-dihydrotriazines by means of acute (contact time: 1, 3 or 5 minutes) minimal bactericidal concentration (MBC) against several bacteria, which may cause nosocomial infections. Such momentarily-strong bactericidal property discovered for the claimed compounds is indispensable and is characteristic for external bactericidal agents (e.g. handwash products), and should be distinguished apparently from the simple anti-bacterial property evaluated by MIC obtained generally from about 24 hrs. incubation.

The effects of sterilizing or disinfecting by the compounds of the present invention are clearly shown in "Bactericidal activity test" on page 104, line 5, to page 108, line 2 of the specification.

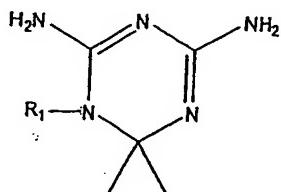
In the Bactericidal activity test, a minimal bactericidal concentration (MBC value) after short contact for 1 min., 3 min., and 5 min., was evaluated.

Tables 15-24 (pages 105-108 of the specification) clearly demonstrate that the compounds of the present invention show excellent sterilizing or disinfecting effects against S. aureus 209PJC, MRSA 97-115, E. Coli NIHJ JC-2, P. aeruginosa PAO-1, MRSA KM 97-53, MRSA KM 97-108, VRE 49, P. aeruginosa No. 12 and P. aeruginosa KM 97-5.

As mentioned above, the dihydrotriazine of the present invention is structurally characterized by (1) an amino group mono-substituted by a specific substituent at the 2-position

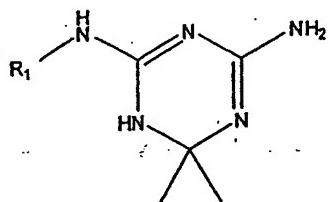
and (2) an amino group mono-substituted by a C₇₋₁₆ alkyl group which is unsubstituted or mono-substituted by a specific substituent at the 4-position of dihydrotriazine of formula (1a).

On the other hand, USP 3,287,365 (Newman '365) describes 2,4-diamino-dihydrotriazine derivatives, as shown below.



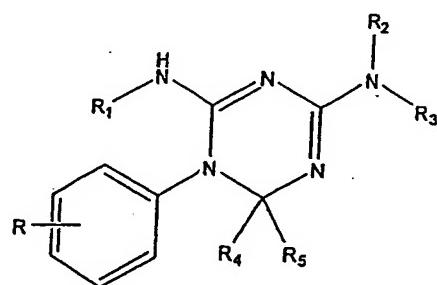
Thus, the substituents at the 2- and 4-positions of Newman '365 are different from those of the present invention.

USP 3,287,366 (Newman '366) describes 2-monosubstituted amino-4-amino-dihydrotriazine derivatives, as shown below.



Thus, the substituent at the 4-position is different from that of the present invention.

Further, J. Org. Chem., 1956, 21(1):14-20 (Modest et al.) describes 1-(unsubstituted or substituted phenyl)-dihydrotriazine derivatives, as shown below.



Thus, the substituent at the 1-position of Modest et al. is different from that of the present invention.

For the foregoing reasons, the compounds of the cited prior art references are structurally quite different from those of the present invention.

In view of the foregoing, the rejection of claims 14 and 33 under 35 USC 102 as anticipated by U.S. Patent No. 3,287,366 is deemed to be overcome.

In addition, the rejection of claims 14 and 33 under 35 USC 102 as anticipated by J. Org. Chem. (Modest et al.) is deemed to be overcome.

Finally, claims 17, 16, 29 and 15 are rejected under 35 USC 103 as lacking patentability over the cited references for the reasons set forth.

These grounds of rejection are also deemed to be overcome in view of the cancellation without prejudice of claims 15, 16, 17 and 29.

In view of the foregoing, it is believed that each ground of rejection set forth in the Official Action has been overcome, and that the application is now in condition for allowance. Accordingly, such allowance is solicited.

Respectfully submitted,

Shirou MAEDA et al.

By: Warren M. Cheek
Warren M. Cheek
Registration No. 33,367
Attorney for Applicants

WMC/dlk
Washington, D.C. 20006-1021
Telephone (202) 721-8200
Facsimile (202) 721-8250
February 6, 2008